

# Triacs

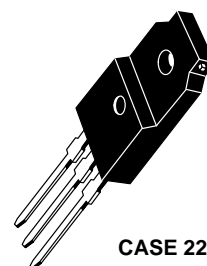
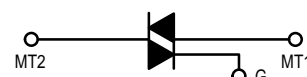
## Silicon Bidirectional Triode Thyristors

... designed primarily for industrial and consumer applications for full wave control of ac loads such as appliance controls, heater controls, motor controls, and other power switching applications.

- Four Mode Triggering for Drive Circuits that Source Current
- All Diffused and Glass-Passivated Junctions for Parameter Uniformity and Stability
- Small, Rugged, Thermowatt Construction for Low Thermal resistance and High Heat Dissipation
- Center Gate Geometry for Uniform Current Spreading

### MAC228FP Series MAC228AFP Series

**TRIACs**  
**8 AMPERES RMS**  
**200 thru 800 VOLTS**



**CASE 221C-02  
STYLE 3**

#### MAXIMUM RATINGS ( $T_J = 25^\circ\text{C}$ unless otherwise noted.)

Rating	Symbol	Value	Unit
Peak Repetitive Off-State Voltage <sup>(1)</sup> ( $T_J = -40$ to $110^\circ\text{C}$ ) 1/2 Sine Wave 50 to 60 Hz, Gate Open MAC228-4FP, MAC228A4FP MAC228-6FP, MAC228A6FP MAC228-8FP, MAC228A8FP MAC228-10FP, MAC228A10FP	$V_{\text{DRM}}$	200 400 600 800	Volts
On-State RMS Current ( $T_C = 80^\circ\text{C}$ ) Full Cycle Sine Wave 50 to 60 Hz	$I_{\text{T(RMS)}}$	8	Amps
Peak Non-repetitive Surge Current (One Full Cycle 60 Hz, $T_J = 110^\circ\text{C}$ )	$I_{\text{TSM}}$	80	Amps
Circuit Fusing ( $t = 8.3$ ms)	$I^2t$	26	$\text{A}^2\text{s}$
Peak Gate Current ( $t \leq 2$ $\mu\text{s}$ )	$I_{\text{GM}}$	$\pm 2$	Amps
Peak Gate Voltage ( $t \leq 2$ $\mu\text{s}$ )	$V_{\text{GM}}$	$\pm 10$	Volts
Peak Gate Power ( $t \leq 2$ $\mu\text{s}$ )	$P_{\text{GM}}$	20	Watts
Average Gate Power ( $T_C = 80^\circ\text{C}$ , $t \leq 8.3$ ms)	$P_{\text{G(AV)}}$	0.5	Watts
Operating Junction Temperature Range	$T_J$	$-40$ to $110$	$^\circ\text{C}$
Storage Temperature Range	$T_{\text{stg}}$	$-40$ to $150$	$^\circ\text{C}$
Mounting Torque		8	in. lb.

1.  $V_{\text{DRM}}$  for all types can be applied on a continuous basis. Blocking voltages shall not be tested with a constant current source such that the voltage ratings of the devices are exceeded.
2. The case temperature reference point for all TC measurements is a point on the center lead of the package as close as possible to the plastic body.

# MAC228FP Series MAC228AFP Series

## THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	2.2	$^{\circ}\text{C/W}$
Thermal Resistance, Case to Sink	$R_{\theta CS}$	2.2 (typ)	$^{\circ}\text{C/W}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	60	$^{\circ}\text{C/W}$

## ELECTRICAL CHARACTERISTICS ( $T_C = 25^{\circ}\text{C}$ and either polarity of MT2 to MT1 voltage unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Peak Blocking Current ( $V_D = \text{Rated } V_{DRM}$ , Gate Open) $T_J = 25^{\circ}\text{C}$ $T_J = 110^{\circ}\text{C}$	$I_{DRM}$	— —	— —	10 2	$\mu\text{A}$ $\text{mA}$
Peak On-State Voltage ( $I_{TM} = 11 \text{ A Peak}$ , Pulse Width $\leq 2 \text{ ms}$ , Duty Cycle $\leq 2\%$ )	$V_{TM}$	—	—	1.8	Volts
Gate Trigger Current (Continuous dc) ( $V_D = 12 \text{ V}$ , $R_L = 100 \Omega$ ) MT2(+), G(+); MT2(+), G(-); MT2(-), G(-) MT2(-), G(+) "A" Suffix Only	$I_{GT}$	— —	— —	5 10	$\text{mA}$
Gate Trigger Voltage (Continuous dc) ( $V_D = 12 \text{ V}$ , $R_L = 100 \Omega$ ) MT2(+), G(+); MT2(+), G(-); MT2(-), G(-) MT2(-), G(+) "A" Suffix Only ( $V_D = \text{Rated } V_{DRM}$ , $T_C = 110^{\circ}\text{C}$ , $R_L = 10 \text{ k}$ ) MT2(+), G(+); MT2(+), G(-); MT2(-), G(-) MT2(-), G(+) "A" Suffix Only	$V_{GT}$	— — 0.2 0.2	— — — —	2 2.5 — —	Volts
Holding Current ( $V_D = 12 \text{ Vdc}$ , $I_{TM} = 200 \text{ mA}$ , Gate Open)	$I_H$	—	—	15	$\text{mA}$
Gate-Controlled Turn-On Time ( $V_D = \text{Rated } V_{DRM}$ , $I_{TM} = 16 \text{ A Peak}$ , $I_G = 30 \text{ mA}$ )	$t_{gt}$	—	1.5	—	$\mu\text{s}$
Critical Rate of Rise of Off-State Voltage ( $V_D = \text{Rated } V_{DRM}$ , Exponential Waveform, $T_C = 110^{\circ}\text{C}$ )	$dv/dt$	—	25	—	$\text{V}/\mu\text{s}$
Critical Rate of Rise of Commutation Voltage ( $V_D = \text{Rated } V_{DRM}$ , $I_{TM} = 11.3 \text{ A}$ , Commutating $di/dt = 4.1 \text{ A/ms}$ , Gate Unenergized, $T_C = 80^{\circ}\text{C}$ )	$dv/dt(c)$	—	5	—	$\text{V}/\mu\text{s}$

FIGURE 1 – RMS CURRENT DERATING

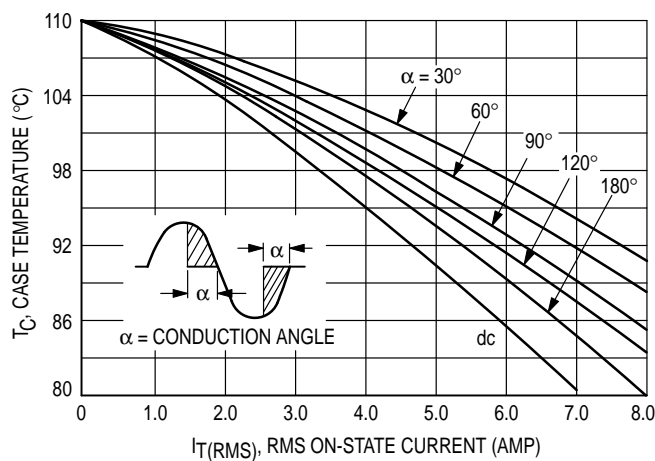
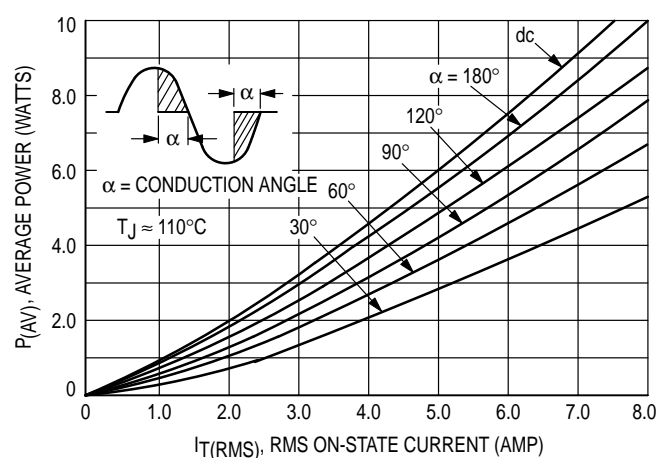
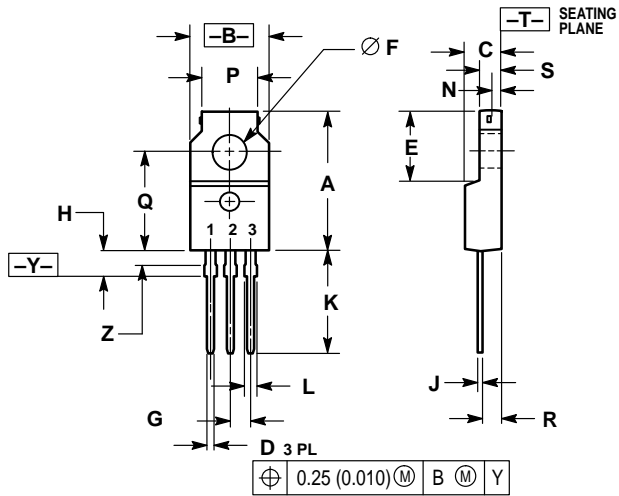


FIGURE 2 – ON-STATE POWER DISSIPATION



PACKAGE DIMENSIONS




STYLE 3:  
PIN 1. MT 1  
2. MT 2  
3. GATE

- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. LEAD DIMENSIONS UNCONTROLLED WITHIN DIMENSION Z.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.680	0.700	17.28	17.78
B	0.388	0.408	9.86	10.36
C	0.175	0.195	4.45	4.95
D	0.025	0.040	0.64	1.01
E	0.340	0.355	8.64	9.01
F	0.140	0.150	3.56	3.81
G	0.100	BSC	2.54	BSC
H	0.110	0.155	2.80	3.93
J	0.018	0.028	0.46	0.71
K	0.500	0.550	12.70	13.97
L	0.045	0.070	1.15	1.77
N	0.049	—	1.25	—
P	0.270	0.290	6.86	7.36
Q	0.480	0.500	12.20	12.70
R	0.090	0.120	2.29	3.04
S	0.105	0.115	2.67	2.92
Z	0.070	0.090	1.78	2.28

CASE 221C-02

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